

Claims

We claim:

- Sub A1
- 1 1. A flame retarding and smoke suppressing additive powder, comprising,
2 by weight:
3 a carbonific material 10.0-12.0%;
4 a heat activated blowing agent 15.5-17.5%;
5 a heat activated halogen material 12.0- 17.0 which forms a fire
6 extinguishing halogen gas under heat;
7 a phosphate material 30-33.4% which forms water and phosphorous
8 when reacting with one or more of the remaining ingredients in the powder
9 under heat; and
10 an inorganic binder 23.5-29.5%.
- 1 2. The powder of claim 1 wherein the carbonific material carbonific material
2 is selected from the group consisting of dipentaerythritol, pentaerythritol,
3 pentaerythritol polyurethane, phenol, triethylene glycol, resorcinol, inositol,
4 sorbitol, dextrin, and starch.
- 1 3. The powder of claim 1 wherein the heat activated blowing agent is
2 selected from the group consisting of urea, butyl urea, dicyandiamide,
3 benzene sulfonyl-hydrazide, melamine, chloroparaffin, guanidine, and
4 glycine.

Sub A2
1 4. The powder of claim 1 wherein the heat activated halogen material is
2 selected from the group of chlorinated paraffin - 40% and chlorinated
3 paraffin - 70%.

1 5. The powder of claim 1 wherein the phosphate material is selected from
2 the group consisting of ammonium polyphosphate, tris(2,3-dibromopropyl)
3 phosphate, tris(beta-chloroethyl) phosphate, guanidine phosphate, urea
4 phosphate, melamine phosphate, monoammonium phosphate, diammonium
5 phosphate and mixtures thereof.

1 6. The powder of claim 1 wherein the inorganic binder is selected from the
2 group consisting of calcium aluminate cement, silica flour, and glass beads.

1 7. The powder of claim 1 further comprising a mixture with a resin wherein
2 the powder is in the range, by weight, of 20-30% and the resin is in the
3 range, by weight, of 70-80%.

1 8. The powder of claim 7 wherein the resin is selected from the group of
2 styrenic, olefinic, acrylic, cellulosic, polyester, and polyamide.

1 9. The powder of claim 7 wherein the resin is a thermoset resin.

1 10. The powder of claim 7 wherein the resin is a curable resin.

11. The powder of claim 8 wherein the resin is selected from the group of resins consisting of resin used in transfer moldings, bulk moldings, sheet moldings, fiber reinforced polymer pultrusions, compression moldings, vacuum injection moldings, assisted resin transfer moldings, pressure bag moldings, hand lay-ups and spray-ups, filament windings, cold press moldings, continuous laminating, rotational moldings, encapsulations and preimpregnations.

SubA3

12. A flame retarding and smoke suppressing additive powder for mixing with resins comprising, by weight:

10.0-12.0% of a carbonific comprising of dipentaerythritol, dipentaerythritol, pentaerythritol, pentaerythritol polyurethane, phenol, triethylene glycol, resorcinol, inositol, sorbitol, dextrin, or starch;

15.5-17.5 of a blowing agent comprising malamine;

12-19.0 of a halogen containing material comprising a chlorinated paraffin;

30-33.4% of a phosphorous containing material which is selected from the group consisting of ammonium polyphosphate, tris(2,3-dibromopropyl) phosphate, tris(beta-chloroethyl) phosphate, guanidine phosphate, urea phosphate, melamine phosphate, monoammonium phosphate, diammonium phosphate; and mixtures thereof;

23.5-29.5% of an inorganic material is selected from the group consisting of calcium aluminate cement, silica flour, and glass beads.